



US Special Operations Command



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Principal Author: MR. NICKOLAS P. ANGELO				Other Author(s):			
Principal Author's Organization: U.S. SPECIAL OPERATIONS COMMAND				X <i>Nickolas P. Angelo</i>			
Complete mailing address: 7701 TAMPA POINT BLVD MACDILL AFB FL 33621-5323				Principal Author's Signature: <i>Nickolas P. Angelo</i> Date: 12 MAY 08			
				Phone: (813) 826-9369			
				FAX: (813) 826-9330			
				Email: ANGELON@SOCOM.MIL			
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Organization: US SPECIAL OPERATIONS COMMAND				Date: 12 MAY 08			
Complete mailing address: 7701 TAMPA POINT BLVD MACDILL AFB FL 33621-5323				Phone: (813) 826-9459			
				FAX: (813) 826-3058			

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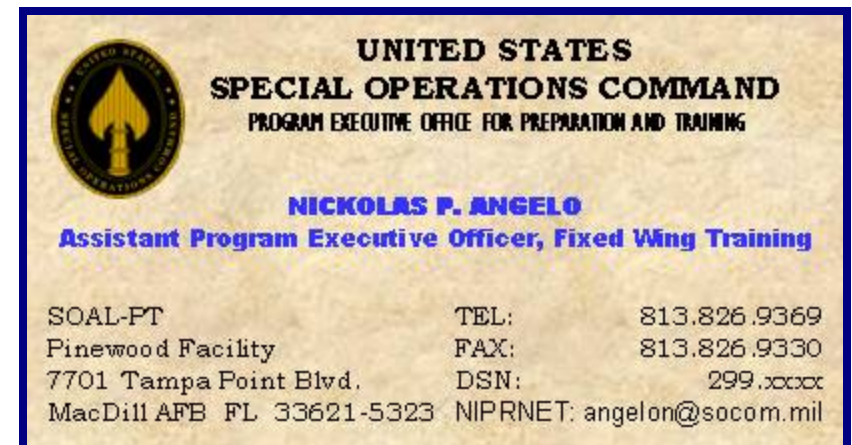
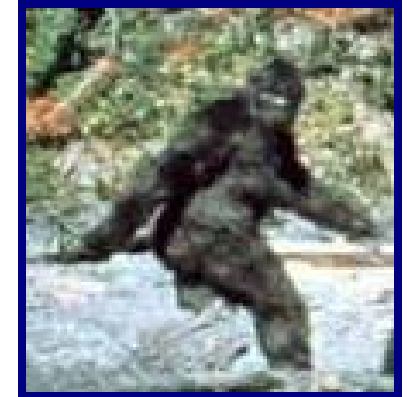


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OVERVIEW

MEASURING TRAINING ROI: SILVER BULLET OR URBAN LEGEND

- SILVER BULLET OR URBAN LEGEND?
- EVALUATION MODELS
- COURSES OF ACTION (ALTERNATIVES)
- EFFECTIVENESS EVALUATION
- COST EVALUATION
- COST-EFFECTIVENESS EVALUATION



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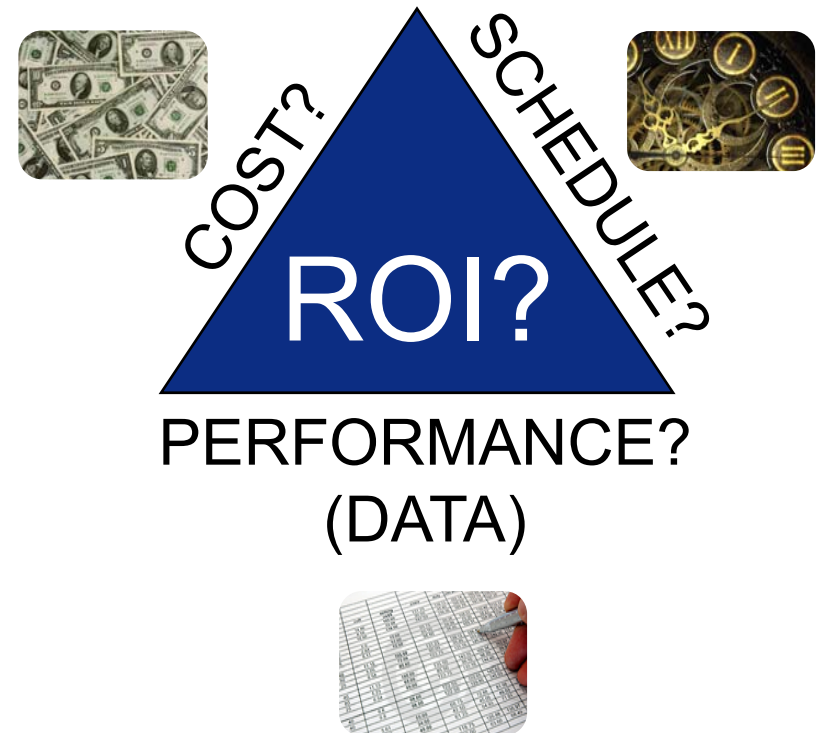
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SILVER BULLET OR URBAN LEGEND?

- SILVER BULLET OR URBAN LEGEND?
 - ANECDOTES
 - ROI DEFINED
 - EVALUATION LEVELS
- EVALUATION MODELS
- COURSES OF ACTION (ALTERNATIVES)
- EFFECTIVENESS EVALUATION
- COST EVALUATION
- COST-EFFECTIVENESS EVALUATION



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SILVER BULLET OR URBAN LEGEND?

ANTECDOTES

"The biggest value that Training ROI ever produced was to sell books for a few authors, so unless you are one of those authors, forget all you have heard and read about. Training ROI is perhaps the least meaningful metric that you can determine when it comes to training, rated just below "smile" sheets. It is NOT indicative of the contribution that training makes to an organization."

Bob Dust, GM Gyro Systems Inc., "The Myth of Training ROI," Jan '04

The problem is that nobody is quite sure what the appropriate metrics are for measuring ROI for learning. Is it student throughput or time to mastery? Is it dropout rates or full-time equivalents returned to the workforce? One thing is certain: many smart people are completely befuddled by the topic."

Marcia L. Conner, Learnativity.com, "How do I measure return on investment (ROI) for my learning program?, 5 Apr '02"

"To some people--me included--the traditional concept of training ROI is obsolete. Astute training managers employ business metrics, not evaluation levels, I believe. Business unit managers value time more than ROI. Major decisions are based on descriptive business cases, not pro forma budgets. Senior executives tend to be more interested in the top line (dramatic growth from new markets and innovation) than the bottom line (the accounting fiction of profits)."

Jay Cross, CEO of Internet Time Group, "A Fresh Look at ROI," Jan 01

"The reason why I won't do an ROI study is that any major change effort within an organization requires not just training, but many other factors."

Daniel R. Tobin, PhD, Corporate learning Strategies, "The Fallacy of ROI Calculations, '98

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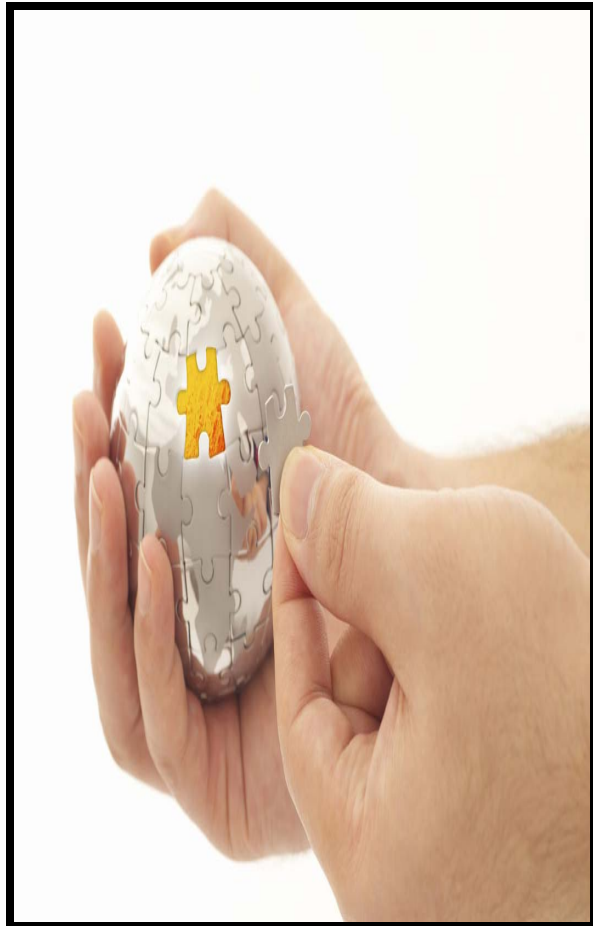
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SILVER BULLET OR URBAN LEGEND?

ROI DEFINED



$$\text{BCR} = \frac{\text{PROGRAM BENEFITS}}{\text{PROGRAM COSTS}}$$

BCR: BENEFITS COST RATIO

TRAINING CHANGE
EFFECTIVENESS



TRAINING CHANGE
COST

$$\text{ROI\%} = \frac{\text{NET PROGRAM BENEFITS}}{\text{PROGRAM COSTS}} \times 100$$

ROI: RETURN ON INVESTMENT

Phillips and Stone. How To Measure Training Results: A Practical Guide To Tracking The Six Key Indicators, 2002, page 11, 19

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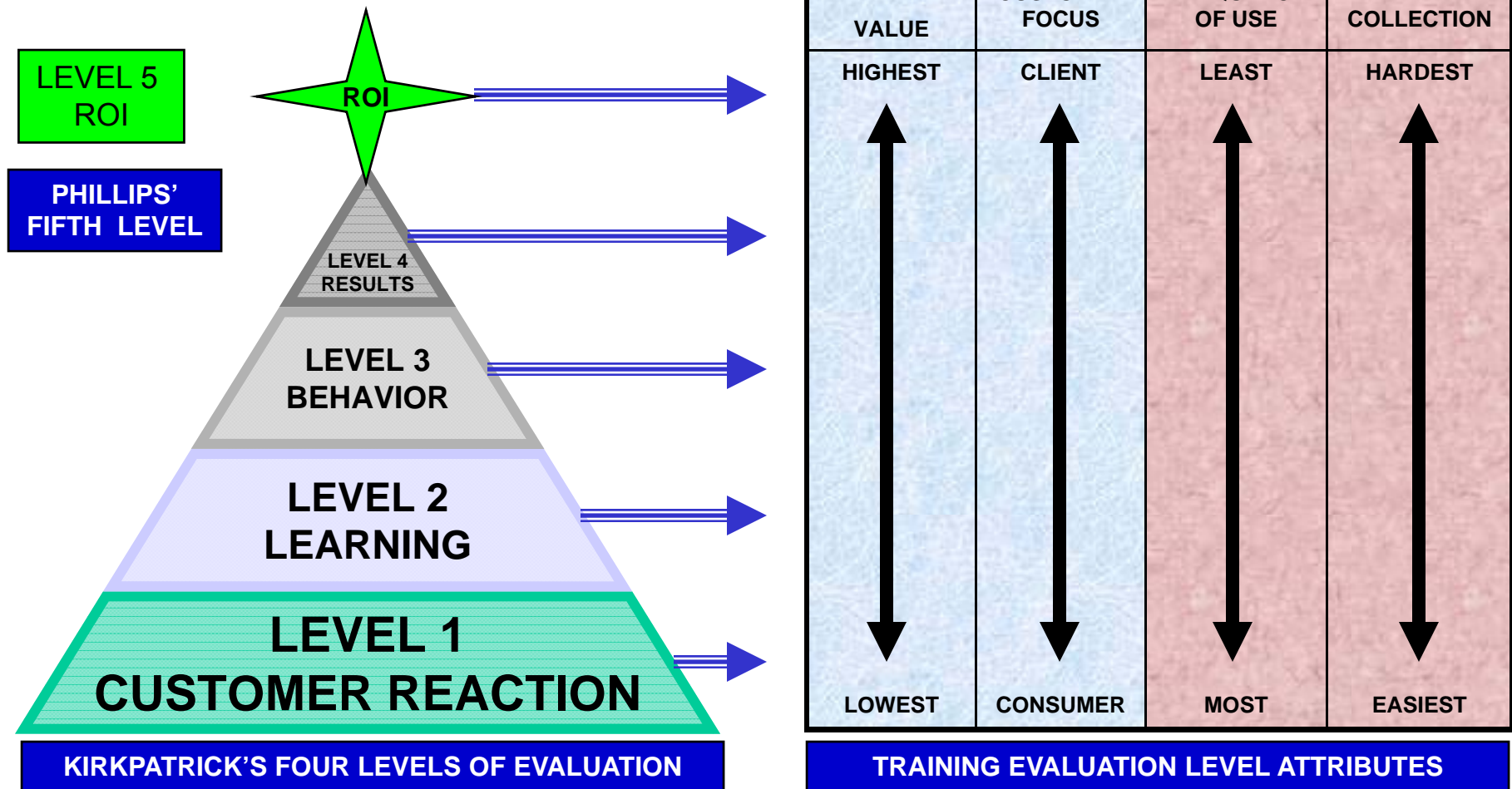
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SILVER BULLET OR URBAN LEGEND?

EVALUATION LEVELS



Phillips. The Bottom Line on ROI: Basics, Benefits, & Barriers to Measuring Training and Performance Improvement, 2002, page 45

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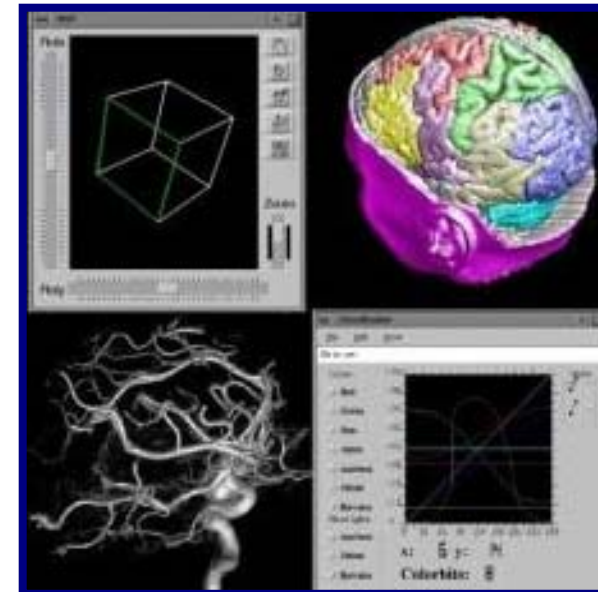
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EVALUATION FRAMEWORKS

- SILVER BULLET OR URBAN LEGEND?
- EVALUATION FRAMEWORKS
 - ANALYSIS OF ALTERNATIVES
 - TRAINING SYSTEMS REQUIREMENTS ANALYSIS
 - M&S RETURN ON INVESTMENT
 - TRAINING RETURN ON INVESTMENT
 - THE HYBRID MODEL
- COURSES OF ACTION (ALTERNATIVES)
- EFFECTIVENESS EVALUATION
- COST EVALUATION
- COST-EFFECTIVENESS EVALUATION



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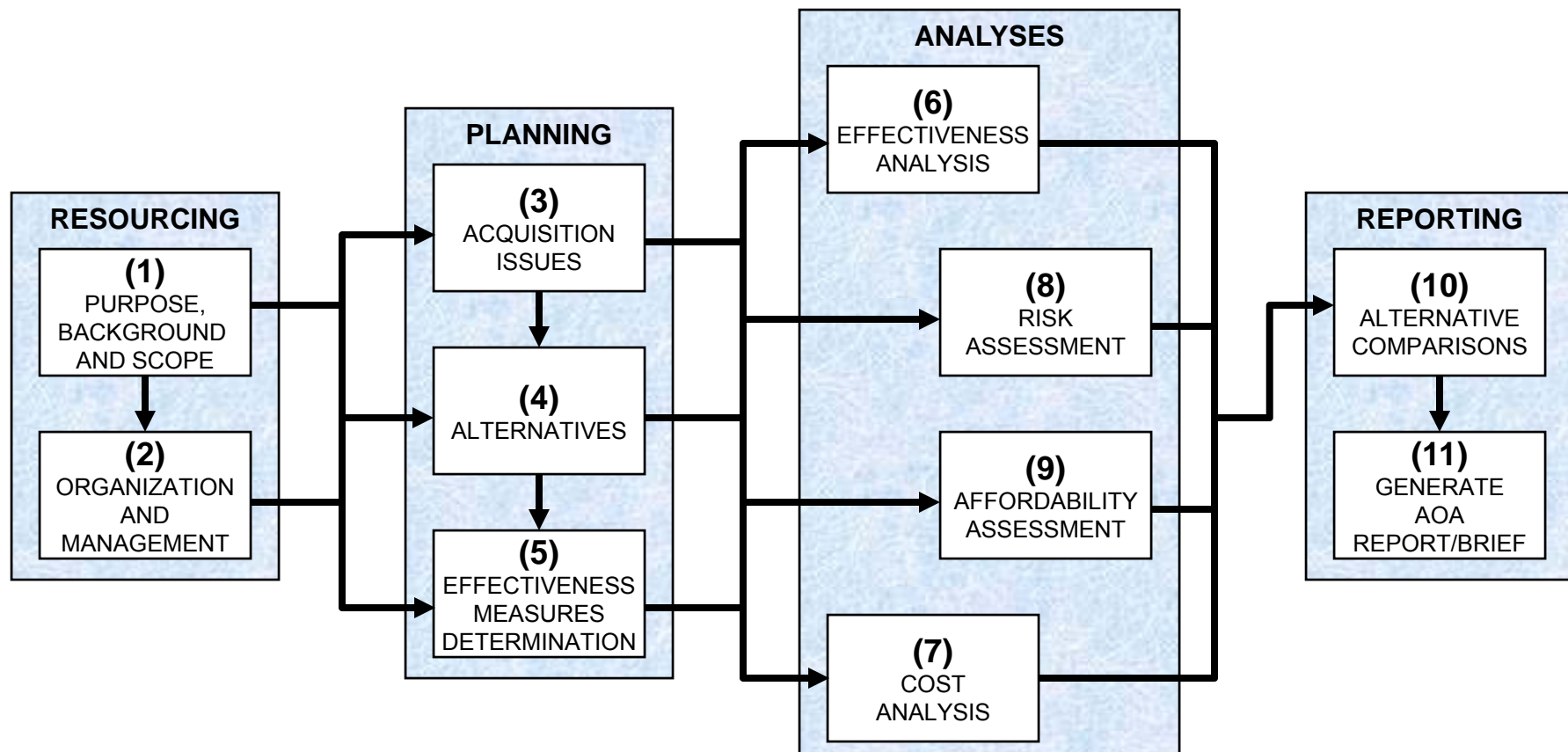
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EVALUATION FRAMEWORKS

ANALYSIS OF ALTERNATIVES (AOA)



U.S. Air force. Air Force Analysis of Alternatives Orientation Course, August 2006

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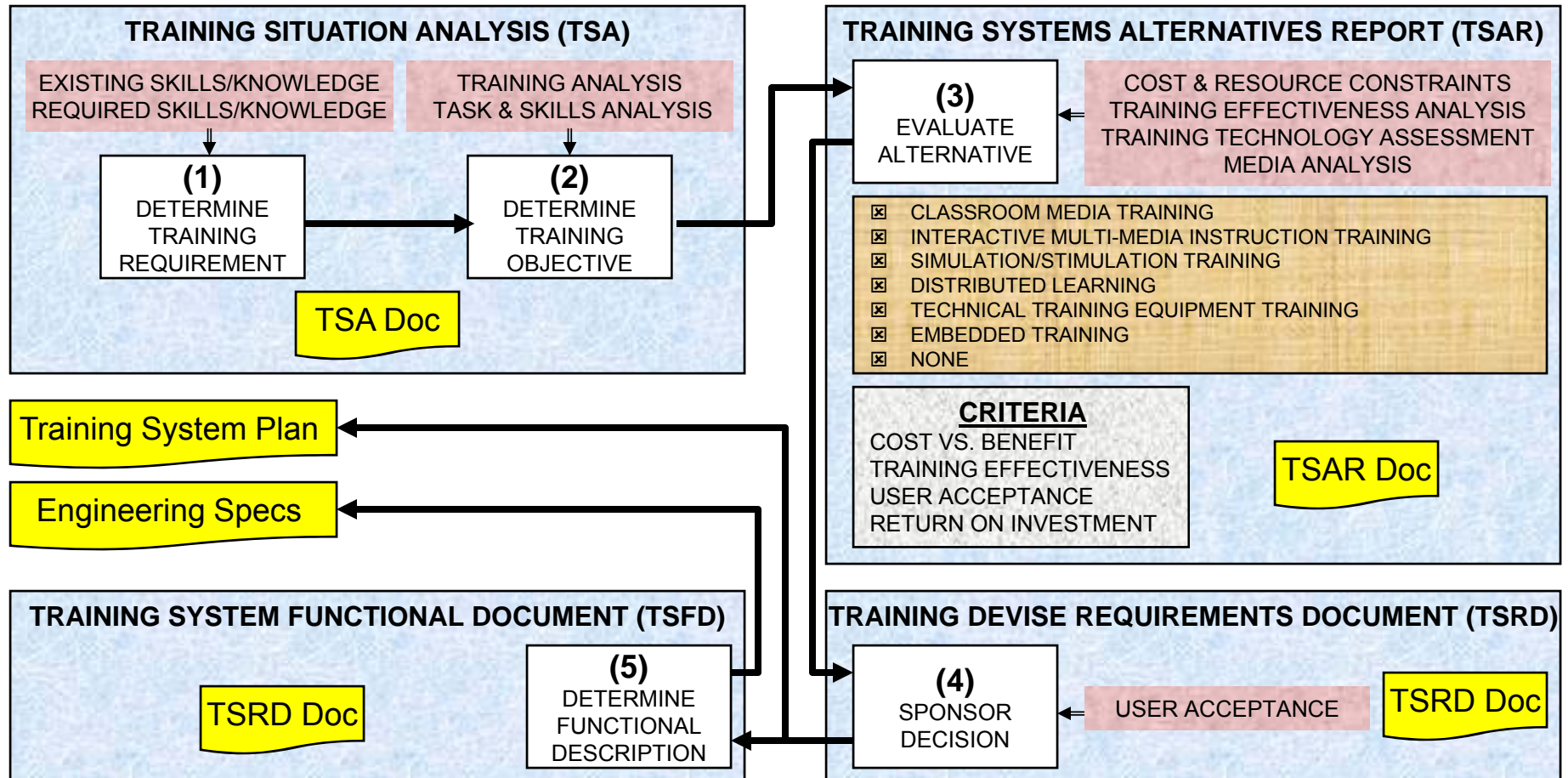
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EVALUATION FRAMEWORKS

TRAINING SYSTEMS REQUIREMENTS ANALYSIS (TSRA)



NAWC Training Systems Division. [Training Systems Requirements Analysis Webpage](#), 30 August 2007

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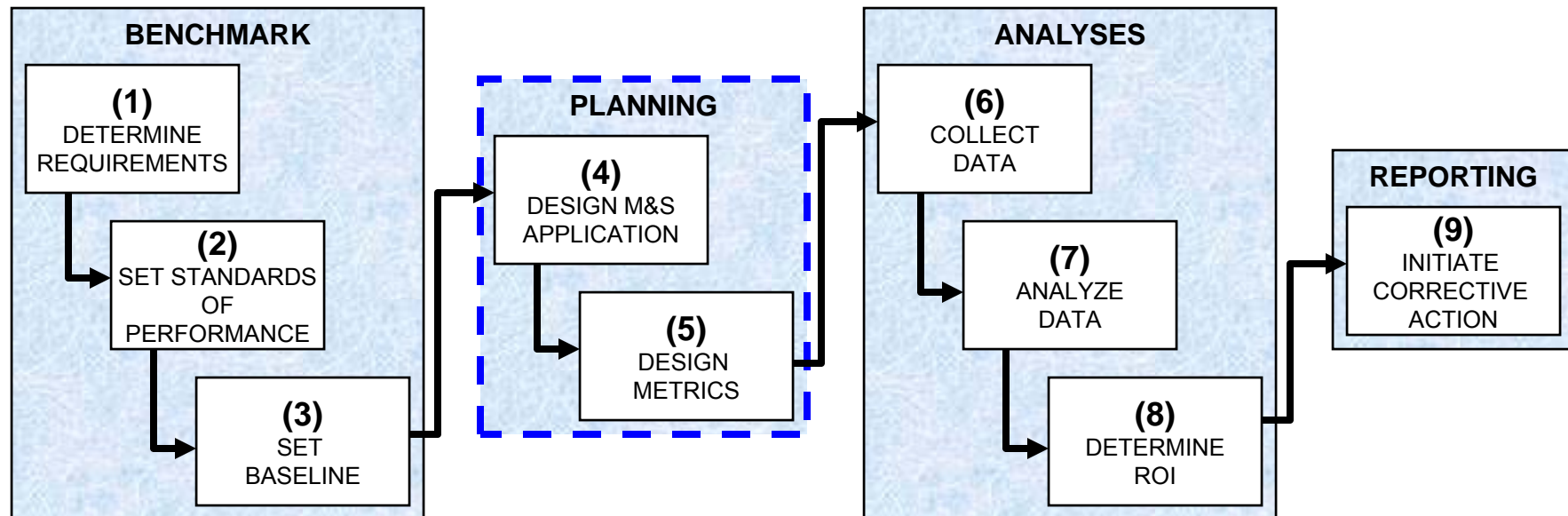
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EVALUATION FRAMEWORKS

M&S RETURN ON INVESTMENT



AFAMS. Return on Investment of Modeling and Simulation (M&S) Workshop Briefing, April 2008

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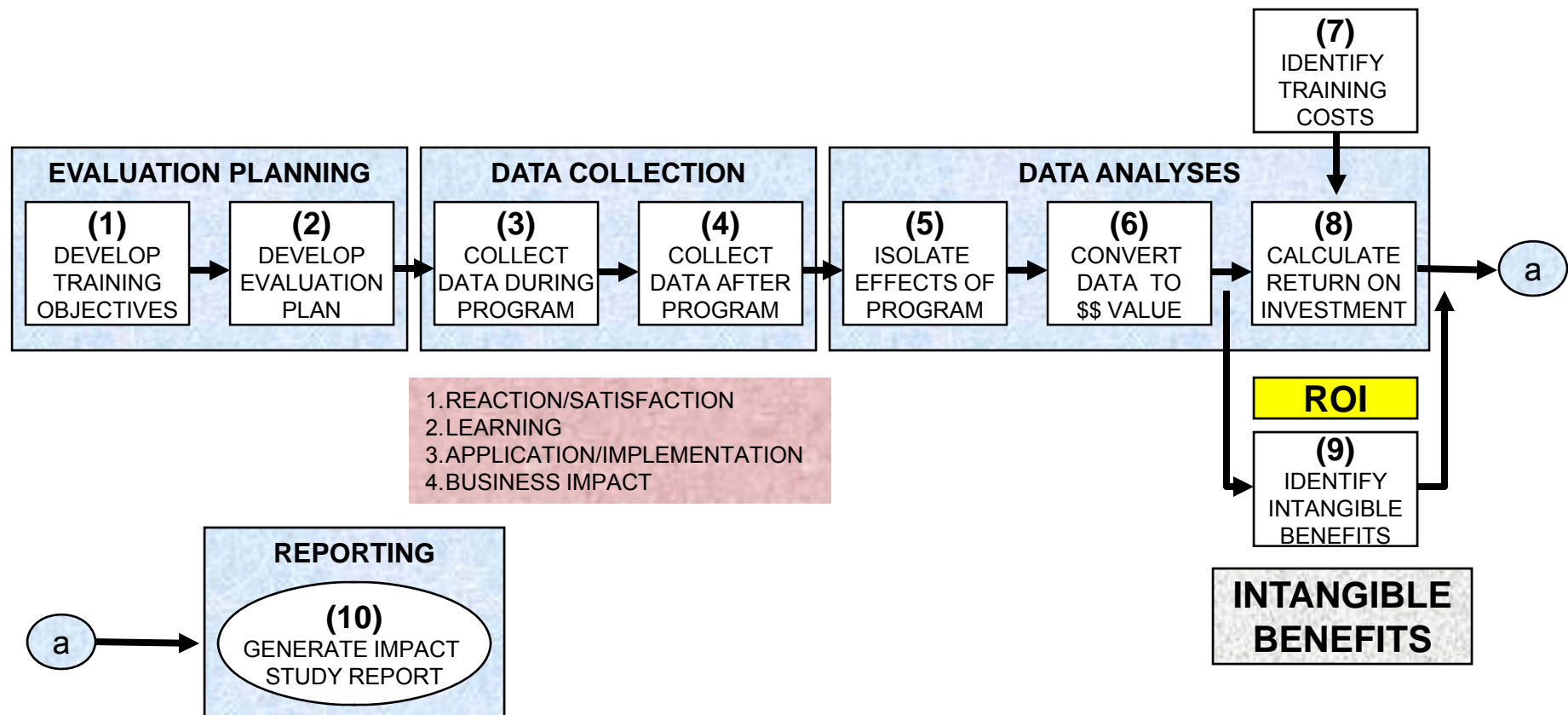
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EVALUATION FRAMEWORKS

TRAINING RETURN ON INVESTMENT (ROI)



Phillips and Stone. How To Measure Training Results: A Practical Guide To Tracking The Six Key Indicators, 2002, page 34

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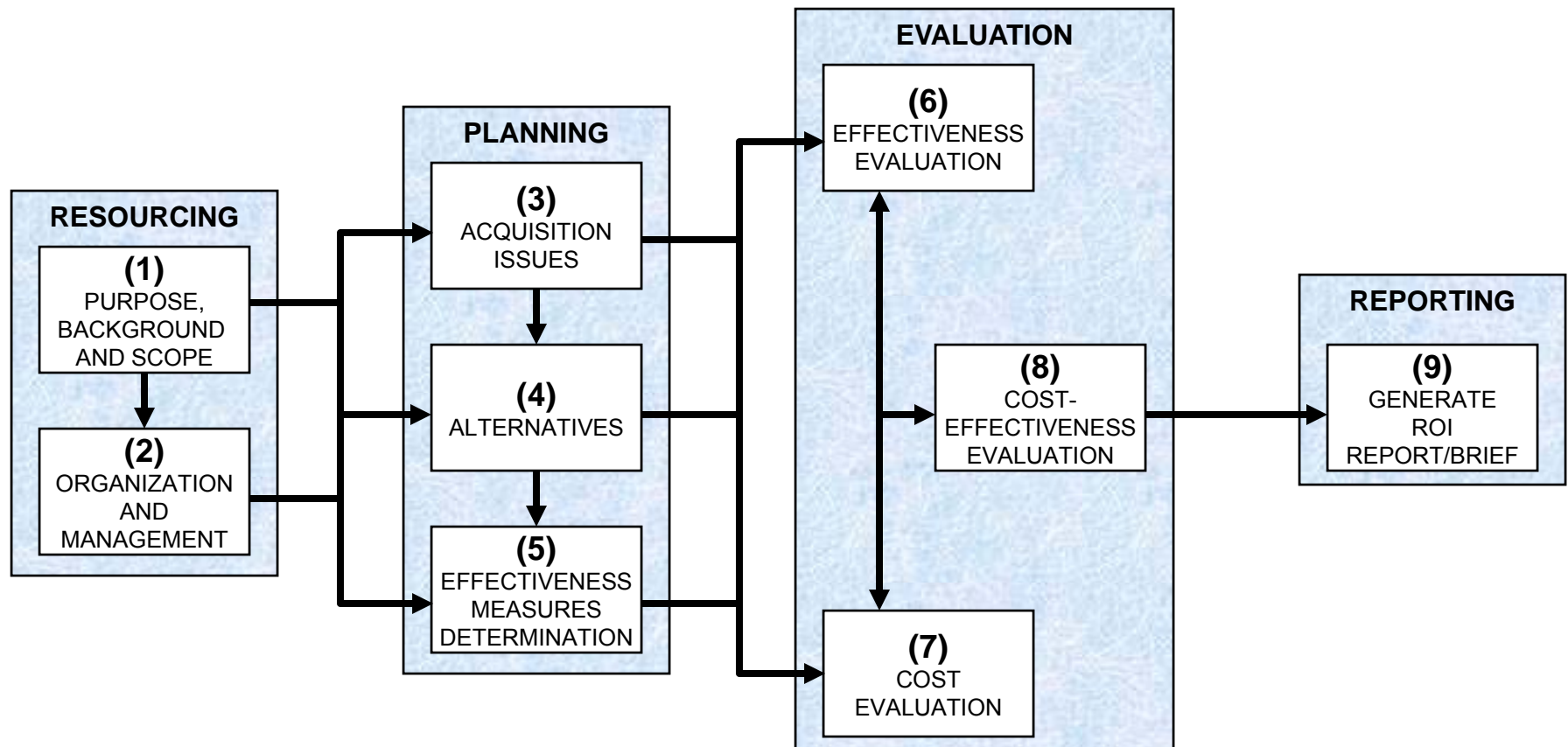
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EVALUATION FRAMEWORKS

HYBRID



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COURSES OF ACTION (ALTERNATIVES)

- SILVER BULLET OR URBAN LEGEND?
- EVALUATION MODELS
- COURSE OF ACTION (ALTERNATIVES)
 - TRAINING SPECTRUM
 - AC-130U ILLUSTRATION
- EFFECTIVENESS EVALUATION
- COST EVALUATION
- COST-EFFECTIVENESS EVALUATION



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COURSES OF ACTION

TRAINING SPECTRUM



AFAMS. Return on Investment of Modeling and Simulation (M&S) Workshop Briefing, April 2008

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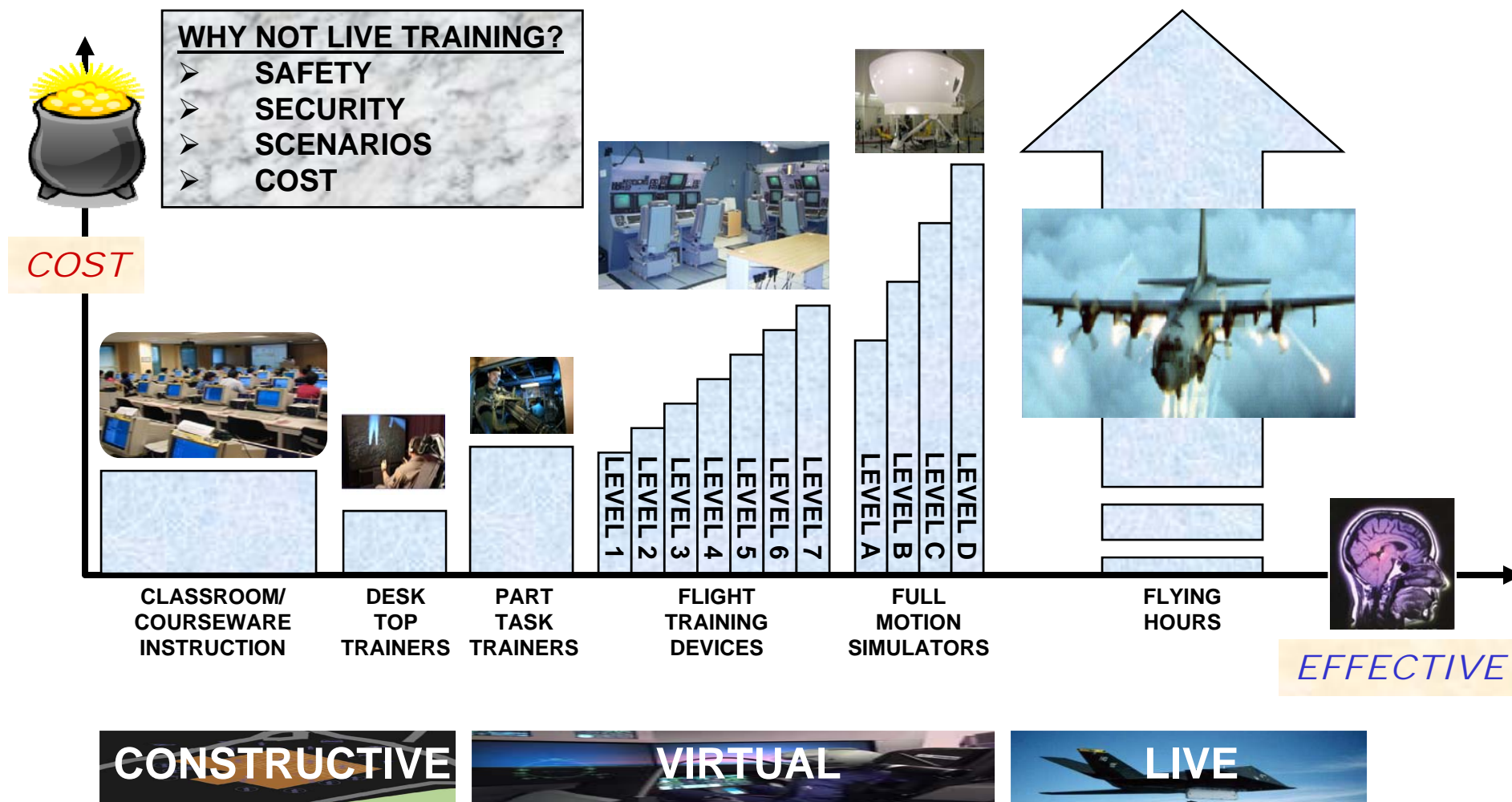
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COURSES OF ACTION

AC-130U ILLUSTRATION



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EFFECTIVENESS EVALUATION

- SILVER BULLET OR URBAN LEGEND?
- EVALUATION MODELS
- COURSES OF ACTION (ALTERNATIVES)
- **EFFECTIVENESS EVALUATION**
 - ATTRIBUTES
 - METRICS
- COST EVALUATION
- COST-EFFECTIVENESS EVALUATION



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EFFECTIVENESS EVALUATION

ATTRIBUTES

■ JOINT TRAINING

- RIGHT INFORMATION
- RIGHT AUDIENCE
- ADAPTABILITY
- RESPONSIVENESS
- INTEROPERABILITY
- LEARNING TRANSFERENCE
- PERSISTENT/REINFORCED
- NETWORKED
- EXPEDITIONARY
- EFFICIENCY

■ MODELING & SIMULATION

- REUSE
- READINESS
- EFFICIENCY
- RISK REDUCTION
- EFFECTIVENESS
- ~~MONEY~~
- ENVIRONMENT
- LIVES
- TIME

JCS. Joint Functional Concept for Joint Training, July 2007

AFAMS. Return on Investment of Modeling and Simulation (M&S) Workshop Briefing, April 2008

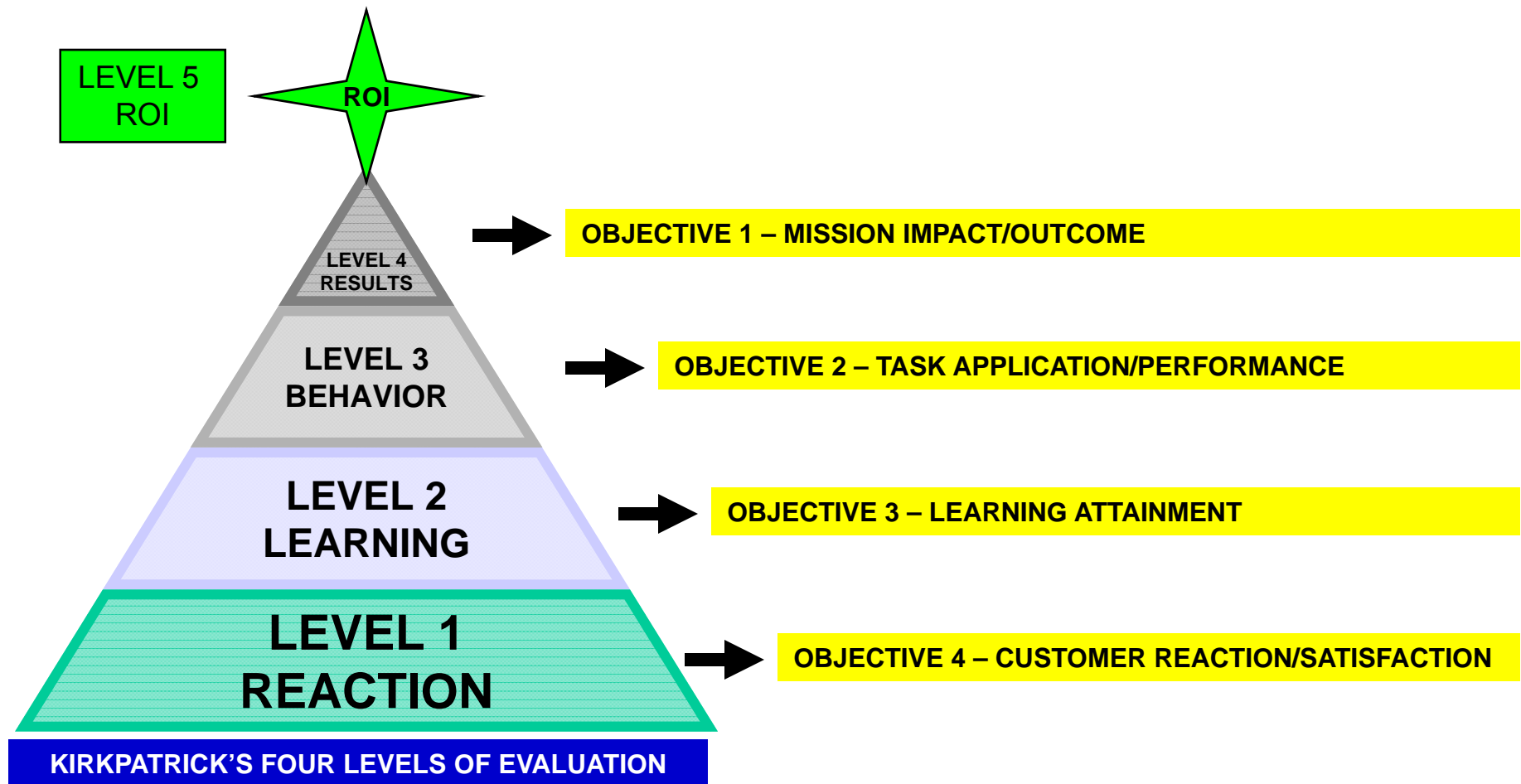
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EFFECTIVENESS EVALUATION METRICS



Phillips. The Bottom Line on ROI: Basics, Benefits, & Barriers to Measuring Training and Performance Improvement, 2002, page 45

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EFFECTIVENESS EVALUATION

METRICS

OBJECTIVE 1 – MISSION IMPACT

MEASURES OF EFFECTIVENESS

1-X: MSN EFFECTIVENESS
(OUTPUT-ORIENTED)

e.g.: SAFETY
ENVIROMENTAL IMPACT
TARGET NEUTRALIZED

DATA SOURCES

- ACTION/IMPROVEMENT PLANS
- ASSIGNMENTS RELATED TO PROGRAM
- FOLLOW-UP
 - PROGRAM SESSIONS
 - QUESTIONNAIRES
- PERFORMANCE
 - CONTRACTING
 - MONITORING

ISOLATING TRAINING EFFECTS DIFFICULT

Phillips and Stone. How To Measure Training Results: A Practical Guide To Tracking The Six Key Indicators, 2002, page 34

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EFFECTIVENESS EVALUATION

METRICS

OBJECTIVE 2 – TASK APPLICATION

MEASURES OF EFFECTIVENESS

2-X: TASK EFFECTIVENESS
(INPUT ORIENTED)

e.g.: TIME
RESOURCES
READINESS
RISK REDUCTION

ISOLATING TRAINING EFFECTS DIFFICULT

DATA SOURCES

- ACTION/IMPROVEMENT PLANS
- ASSIGNMENTS RELATED TO PROGRAM
- OBSERVATIONS ON-THE-JOB
- FOLLOW-UP
 - FOCUS GROUPS
 - INTERVIEWS
 - PROGRAM SESSIONS
 - QUESTIONNAIRES
 - SURVEYS
- PERFORMANCE
 - CONTRACTING

Phillips and Stone. How To Measure Training Results: A Practical Guide To Tracking The Six Key Indicators, 2002, page 34

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EFFECTIVENESS EVALUATION METRICS

OBJECTIVE 3 – LEARNING

MEASURES OF EFFECTIVENESS

- 3-1: TRAINING PROFICIENCY RATIO
- 3-2: TRAINING THROUGHPUT RATIO
- 3-3: TRAINING APPLICABILITY RATIO
- 3-4: TRAINING APPROPRIATENESS RATIO

DATA SOURCES

- ASSESSMENTS
 - SELF
 - TRAINER
- TESTS
 - FORMAL
 - CRITERIA REFERENCED
 - PERFORMANCE BASED
 - SIMULATION
- EXERCISES/ACTIVITIES

Bob Dust. The Myth of Training ROI, January 2004

Phillips and Stone. How To Measure Training Results: A Practical Guide To Tracking The Six Key Indicators, 2002, page 34

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EFFECTIVENESS EVALUATION METRICS

OBJECTIVE 4 – REACTION

MEASURES OF EFFECTIVENESS

4-1: STUDENT COURSE REACTION RATINGS

- 4-1-1: COURSE OVERALL
- 4-1-2: COURSE CONTENT
- 4-1-3: COURSE METHODOLOGY
- 4-1-4: COURSE FACILITY
- 4-1-5: COURSE INSTRUCTION
- 4-1-6: COURSE CHANGE ASSESSMENT

4-2: ADMINISTRATION REACTION RATINGS

- 4-1-1: CURRICULUM OVERALL
- 4-1-2: CURRICULUM CONTENT
- 4-1-3: CURRICULUM METHODOLOGY
- 4-1-4: CURRICULUM FACILITY
- 4-1-5: CURRICULUM INSTRUCTION
- 4-1-6: CURRICULUM CHANGE ASSESSMENT

DATA SOURCES

■ INITIAL

- INTERVIEWS
- QUESTIONNAIRES

Phillips and Stone. How To Measure Training Results: A Practical Guide To Tracking The Six Key Indicators, 2002, page 34



EFFECTIVENESS EVALUATION

METRICS

TRAINING ISOLATION/MONETARY CONVERSION

TRAINING EFFECTS ISOLATION

- CONTROL GROUPS
- TREND LINE ANALYSIS
- FORECASTING
- PARTICIPANT ESTIMATE
- SUPERVISOR ESTIMATE
- MANAGEMENT ESTIMATE
- CUSTOMER INPUT
- EXPERT ESTIMATE
- SUBORDINATE INPUT
- OTHER FACTORS IMPACT

TRAINING "\$" CONVERSION

- CONVERTING
 - OUTPUT TO CONTRIBUTION
 - COST OF QUALITY
 - EMPLOYEE TIME
- HISTORICAL COSTS
- INTERNAL/EXTERNAL EXPERTS
- INTERNAL/EXTERNAL DATABASES
- PARTICIPANTS' ESTIMATES
- LINKING WITH OTHER MEASURES
- SUPERVISOR/MANAGER ESTIMATES
- TRAINING STAFF ESTIMATES

Phillips and Stone. How To Measure Training Results: A Practical Guide To Tracking The Six Key Indicators, 2002, page 34



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COST EVALUATION OVERVIEW

- SILVER BULLET OR URBAN LEGEND?
- EVALUATION MODELS
- COURSES OF ACTION (ALTERNATIVES)
- EFFECTIVENESS EVALUATION
- COST EVALUATION
 - ATTRIBUTES
 - METRICS
- COST-EFFECTIVENESS EVALUATION



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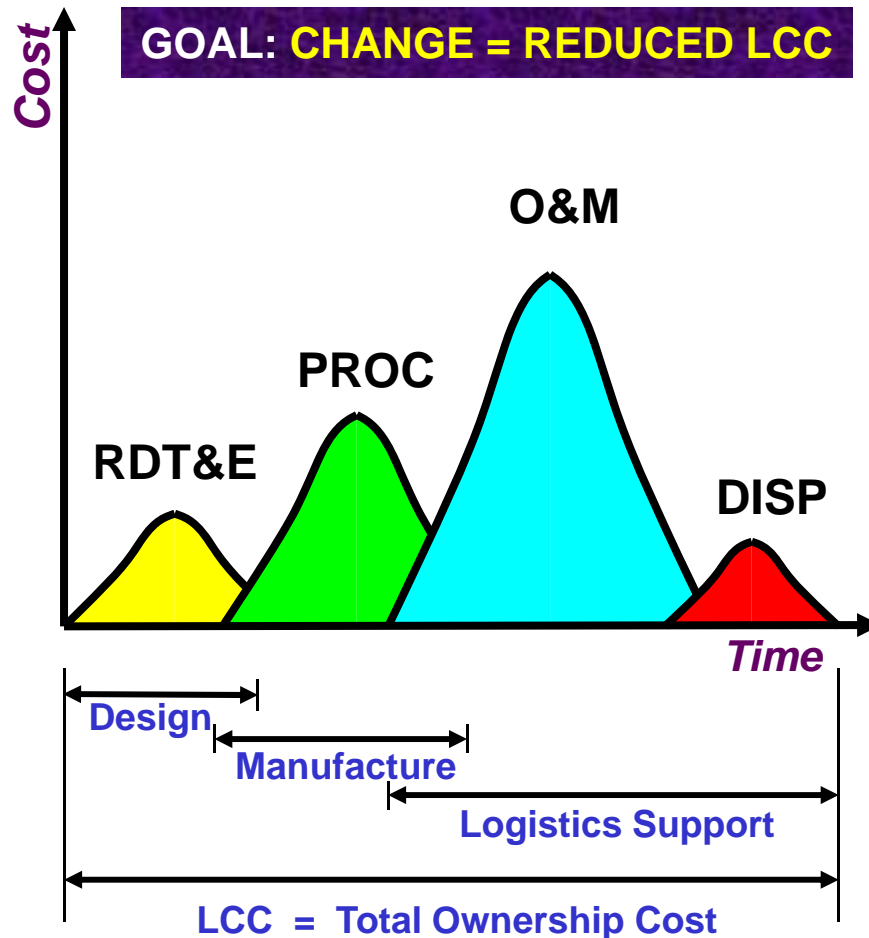
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COST EVALUATION ATTRIBUTES



- **Research and Development** – All costs required to research and develop a system before committing it to production (engineering design, manufacturing of test articles, testing to prove the design, contractor ST&E, engineering development equipment, software development, intelligence design, data, etc)
- **Investment/Production** – Costs associated with the fabrication, assembly and delivery of a system (prime mission equipment, support equipment, initial spares, modification to existing platforms, intelligence production, integration costs, data, etc)
- **Operations & Support** – Includes all direct and indirect costs required for operation and support of a system (cost of personnel, materials, facilities, depot maintenance, inventory management control, intelligence support, data, etc)
- **Disposal** – Cost to dispose of the system after its useful life (disposal or long-term storage costs, environmental and related costs, development and manufacturing cleanup costs, etc)

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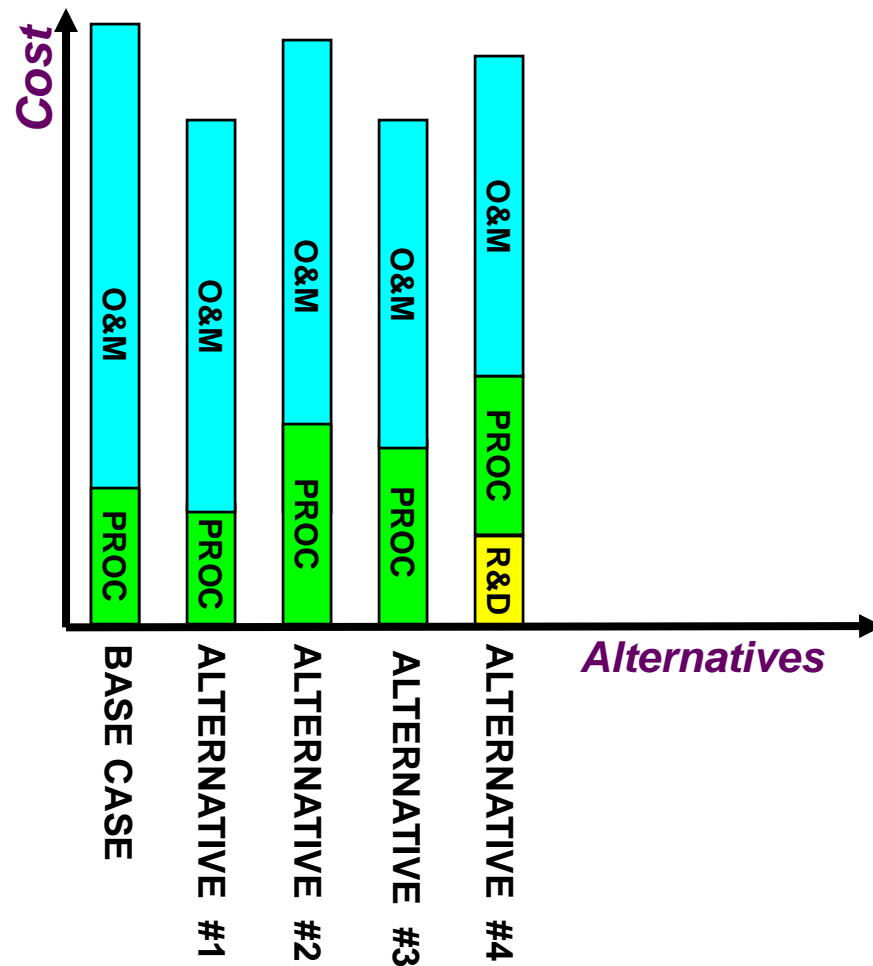
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COST EVALUATION METRICS



■ MEASURES OF COST

- BREAK EVEN
- PAYBACK

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COST-EFFECTIVENESS EVALUATION

OVERVIEW

- SILVER BULLET OR URBAN LEGEND?
- EVALUATION MODELS
- COURSES OF ACTION (ALTERNATIVES)
- EFFECTIVENESS EVALUATION
- COST EVALUATION
- COST-EFFECTIVENESS EVALUATION
 - ATTRIBUTES
 - METRICS



Δ EFFECTIVENESS

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COST-EFFECTIVENESS EVALUATION

ATTRIBUTES

PROBABILITY OF RISK		
<u>Process Past Performance</u> The process...	<u>Observed Process Characteristics</u> The process looks like...	<u>Level/Likelihood</u>
...Risk events are imminent and cannot be avoided under current conditions – incapable process	Lack of planning and management for any process change; any success is due to individual effort/knowledge	5 Nearly Certain
...expects risk events and most of them are likely to occur – incapable process	Process management based on experience with similar processes; successful practices used	4 Highly Likely
...anticipates risk events but may not avoid them – marginally capable process	Tech and management aspects of process documented; standards used; sub-processes understood and used to improve process	3 Likely
...has usually avoided or resolved risk events in similar cases – capable process	Quantitative management of process capability; trends are predicted	2 Unlikely
...will effectively avoid or resolve risk events using standard practices – highly capable process	Continuous improvement is norm; best practices used; process capability expanded routinely	1 Remote

PROBABILITY	5	M	M	H	H	H
	4	L	M	M	H	H
	3	L	L	M	M	H
	2	L	L	L	M	M
	1	L	L	L	L	M
		1	2	3	4	5
		IMPACT				

IMPACT OF RISK			
Effectiveness	Schedule	Cost	Level
Minimal/No Impact	Minimal/No Impact	Minimal/No Impact	1
Acceptable; Some Margin Reduction	Meets milestones	Increase <5%	2
Acceptable; Significant Margin Reduction	Minor milestone slip	Increase 5-7%	3
Acceptable, No Margin Remaining	Major milestone slip	Increase >7-10%	4
Unacceptable	Not Meet Milestones	Increase >10%	5

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COST-EFFECTIVENESS EVALUATION

METRICS

ALTERNATIVES	MEASURES OF EFFECTIVENESS								RISK	TOTAL LCC
	OBJECTIVE 1 MSN IMPACT		OBJECTIVE 2 TASK PERF.		OBJECTIVE 3 LEARNING		OBJECTIVE 4 REACTION			
	MOE 1-1	MOE 1-2	MOE 2-1	MOE 2-2	MOE 3-1	MOE 3-2	MOE 4-1	MOE 4-2		
#1 (BASE CASE)	Green	Yellow	Red	Green	Yellow	Red	Yellow	Green	Yellow	Red
#2	Red	Green	Red	Yellow	Yellow	Green	Yellow	Yellow	Red	Green
#3	Green	Red	Yellow	Red	Green	Yellow	Red	Green	Yellow	Red
#4	Green	Yellow	Green	Red	Yellow	Green	Green	Yellow	Red	Green
#5	Yellow	Green	Red	Green	Yellow	Green	Green	Green	Yellow	Yellow
#6	Red	Yellow	Green	Yellow	Green	Red	Yellow	Red	Red	Yellow

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SUMMARY

■ 1. BENCHMARK CURRENT TRAINING PROGRAM

- TRAINING PROGRAM EFFECTIVENESS (INCLUDE CAPABILITY GAPS)
- TRAINING PROGRAM COST

■ 2. TREAT TRAINING AS EXPENSE

- COMPARE TRAINING PROGRAM COSTS (CURRENT vs NEW)
- DETERMINE PAYBACK OF NEW TRAINING PROGRAM, IF ANY

■ 3. ISOLATE THE BENEFITS

- COMPARE TRAINING PROGRAM EFFECTIVENESS (CURRENT vs. NEW)
- DETERMINE BENEFITS OF NEW TRAINING PROGRAM, IF ANY

■ 4. AVOID THE “ROI” RATIO

- ONE NUMBER MEANS NOTHING
- CONSIDER THE FOLLOWING EXPRESSIONS (OBJ. 3) OF RETURN:
 - ___ % IMPROVED PROFICIENT
 - ___ % IMPROVED THROUGHPUT
 - ___ % INCREASES SKILLS VALUED BY COMMAND
 - ___ % INCREASED TRAINING SPECIFIC PEOPLE IN SPECIFIC FUNCTIONS



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QUESTIONS?

DILBERT
BY SCOTT ADAMS

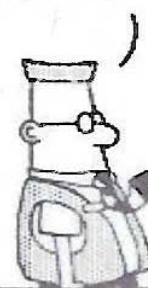
MY **SIMULATOR** IS
TOO SLOW. I NEED
TO UPGRADE IT.



I NEED A COST-
BENEFIT ANALYSIS
INCLUDING THE COST
OF ALL ALTERNATIVES,
AND VICE PRESIDENT
APPROVAL.



IT WAS EASIER TO GET
A SECOND JOB AND PAY
FOR THE UPGRADE
MYSELF.



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